CLAIMS

1. Method of production of innerspring units made of springs (1) that are encapsulated into pockets (2) made of flexible mattress-making material (5) that are connected between them forming strips (3), which strips are adhered to one another to create mattresses (4), which can have layers parallel to their main surfaces, each layer with a different rigidity value, which is characterized by the fact that all the springs needed to construct a single strip, whose length corresponds to the length of the side of the produced mattress, are produced simultaneously by equal in number to the springs spring coilers, which produce springs with the same or different rigidity, having a common motion source for their concurrent operation, where the continuous rows of the produced springs may undergo thermal batch processing, entering simultaneously and in a controlled constant arrangement into a special chamber, which is kept at the appropriate temperature, where after their exit by means of suitable mechanisms commences an approach of the trajectories of the springs produced from each spring coiler so as for each spring to acquire with their adjacent springs the necessary distances, which springs are compressed by simultaneous compressive action (6) they are all moved in a parallel arrangement to their final position, which is within a flexible mattress-making material (5), which being folded at once along its entire length with respect to the middle width axis covers them, where subsequently in case the flexible material is thermally weldable it gets adhered simultaneously at the transverse positions (7) in between springs, and along its lengthwise side (8), where its free ends are, with an equal in number springs plus one thermal welding devices, creating an equal in number to the springs parallel pockets (2), where in case the material is non-weldable thermally then they are utilized an equal in number to the springs plus one connecting clipping mechanisms that employ suitable clips, preferably metallic, being capable for the mechanisms of thermal welding or of connection by clipping to move towards one another, creating the necessary each time new dimensions of the pockets, being capable for the lengthwise flexible mattress-making material that is needed for the whole row to consist of two separate and equal in length lengthwise pieces, which after being positioned parallel to one another cover up the row of springs and encapsulate them, where in this case they are thermally welded or clipped also along the second lengthwise free end edge (9), so as to create the closed pockets, being capable for the lengthwise flexible mattress-making material (5) to have been measured up and cut to the necessary length and in such a fashion as to arrive at the spring row engagement position where welding or clipping is to take place by moving along its width, being capable for certain turns (11) of each spring after being compressed towards the bottom end of the pocket

so as to create the necessary spring rigidity intensity to remain there by attachment (12) of that spring turn immediately higher than the pre-compressed ones through a suitable mechanism onto the sidewalls of the pocket (16a, 17, 18), where the rest spring turns remain with a smaller degree of rigidity, imparting thus in the same spring two different zones of rigidity, where in the mattress that is produced this feature creates layers with different rigidity values parallel to the main surfaces of the mattress, where the continuously produced strips (3) can be adhered to one another by the simultaneous application of hot adhesive quantities (19) on the side cylindrical walls of the previously produced strip (20) of the processed mattress onto which each newly produced strip that does not bear hot adhesive is being compressed against and adhered to, creating thus the final product, being capable for the produced mattresses to be overlaid with woven or non woven mattress-making sheets that are adhered with one of the known methods, where the woven or non woven mattress-making sheets are not cut off, having as a result the production of mattresses in large length stocks.

2. Method of production of innerspring mattresses according to Claim 1, which is characterized by the fact that the springs (1) are being produced from spring coilers that are by preference equal in number to the array of springs that are necessary for the creation of one side of the mattress, but are at least more than six spring coilers so as to maintain the massive character of the production, where in this case the simultaneously produced springs when they have completed the count of springs that a whole row necessitates are subsequently led with the necessary groupwise step repetitions through the same operations so as to complete the formation of the strips.

3. Method of production of innerspring mattresses according to Claim 1, which is characterized by the fact that one or more intermediate spring turns (11) of the pocketed springs can get compressed with a suitable mechanism towards the bottom end of the pocket and at a desirable depth, then to have attached, with a suitable means onto the sidewalls of the pockets (12) the spring turn immediately on top of these spring turns, encapsulating thus the preceding spring turns so as to create the necessary rigidity creating the first layer of rigidity, where the same process can be repeated with other selectable intermediate spring turns (13) which after again compressing the next group of intermediate spring turns on top of the previously attached spring turn are also held in position, being connected with the pocket sidewalls (14) creating thus a second layer of rigidity, where the remaining spring turns (15) entrapped between the lastly attached spring turn and the closed roof end of the pocket create

the last layer of rigidity, so that with the utilization of only one spring multiple layers of rigidity are achieved, which impart to the mattress conditions of sub-mattress, mattress and top mattress composite structures.

4. Method of production of innerspring units according to Claim 1 and 3, which is characterized by the fact that one or both end spring turns of the pocketed spring are not encapsulated by closing the edges of the pockets but are firmly attached and held circumferentially at the rim edges of the pocket (16), so that the pocket can remain open at the corresponding side facilitating the aeration of the mattress.

5. Method of production of innerspring units according to Claim 1, which is characterized by the fact that there exist equal in number to the encapsulated springs plus one attachment mechanisms that attach with preferably metallic clips simultaneously all the necessitated widthwise and lengthwise sides, where each mechanism is equipped with multiple attachment heads in selected distances between them attaching with multiple attachments the transverse sides of each pocket, as well as respective mechanisms that attach along the length one or both the lengthwise edges of the strip.

6. Method as described in Claim 1, which is characterized by the fact that the produced mattresses that have their top and bottom surfaces adhered with woven or non woven mattress-making sheets can be not separate pieces but can be produced in a continuous form connected between them through their overlaying sheets and thus in this form to be compressed and packaged into rolls without the need to use strips of paper, where afterwards with gradual unrolling one can severe mattresses of different widths depending on the arising production needs.

7. Method as described in Claim 1, which is characterized by the fact that the thermal welding for the simultaneous creation of the pockets and the encapsulation of the springs of the whole strip can be accomplished through electrical resistances that cover all the necessary positions for welding and operate while being heated simultaneously, where as a result the upper and lower sheets of the strip get adhered creating all the necessary pockets and simultaneously encapsulating all the springs.

8. Method as described in Claim 1, which is characterized by the fact that the thermal welding for the simultaneous creation of the pockets and the encapsulation of the springs of the whole strip can be accomplished through metallic thin plates that have the shape and length of the surface areas that are to be welded, which thin plates are preheated in another position, transmitting the necessary temperature at the point where they compress simultaneously the whole length of the constructed strip, welding at the transverse and longitudinal positions the non woven sheet, creating thus all the pockets and encapsulating simultaneously all the springs.

9. Method as described in Claim 1, which is characterized by the fact that the thermal welding can be accomplished simultaneously in all the necessary points of the strip by forcing hot air through a suitable mechanism, creating as a result the pockets and the encapsulation of all the springs.

10. Method as described in Claims 1, 8 and 9, which is characterized by the fact that the shapes of the welded positions of the pocket strip can have curved forms or combinations of straight and curved forms that is accomplished by appropriately shaping the thin metallic plates that transfer the heat or in other cases appropriately shaping the respective distribution network of the forced hot air.

11. Method of construction of innerspring mattresses as described in Claim 1, which is characterized by the fact that the welded in between them strips can get adhered in a differential height arrangement, placing consecutive rows in an alternate fashion at different height differentials between them, creating thus lengthwise or widthwise waveforms on the whole upper and lower surface of the mattress.

12. Mattress made of springs encapsulated into pockets made of flexible mattress-making material that has multiple layers (11, 13, 15) with different rigidity values, which is characterized by the fact that the layers of different rigidity value are created by only one layer of springs (1), achieving the creation of layers having different rigidity by the compression of certain spring turns of each spring and their maintenance at that position by their attachment (16a, 17, 18) to the pocket sidewalls, where the same method is repeated to create in the same spring second or multiple layers of rigidity, creating thus conditions that

exist when mattresses with three different rigidity values are used positioned one on top of the other as a submattress, mattress and top mattress composite structure.

13. Mattress as described in Claim 1, which is characterized by the fact that the one end spring turn of the spring is perimetrically attached through a suitable mechanism to the open edges of the pocket, where in the particular case these edges are not adhered or attached between them to form a pocket with closed ends, being capable for the other opposite end spring turn to be attached on the edges of the pocket on the opposite side, when that one is also open in cases where the pocket strip is constructed from two separate lengthwise parts that are adhered or attached only at the widthwise sides of the pockets, creating thus a cylindrical opening that can serve as an aeration channel.

14. Mattress as described in Claims 12 and 13, which is characterized by the fact that it is feasible after the complete encapsulation of the springs into the pockets to attach with a suitable mechanism the two end spring turns to the non woven sheet of the mattress-making material with which they are in contact, where subsequently, after the spring has been firmly attached on both its sides, appropriate material is removed from the non woven sheet in the two parallel sides of the pocket, creating thus a free passage for aeration.

15. System of mechanisms for the construction of innerspring mattresses made of springs that are encapsulated in pockets of mattress-making material that is thermally weldable or is made of woven material, which is characterized by the fact that all the springs of each row that are needed for the construction of the whole length of the side of the mattress are produced simultaneously by an equal in number to the springs spring coilers that are set in motion by a common axle in order for them to work together, having on top of the set of the rollers that advance the wire compression pistons, each one with its own actuating valve, where through the computer it is programmed how many wires are to be advanced in order to produce the necessary springs each time, where the formation of the pitch of the springs is done by a lengthwise mechanism (24) which acts through a respective set of arms (25), which compress the produced spring turns, where also the diameter of the produced springs is created by a respective lengthwise mechanism (26) with a respective set of arms (27) that presses the wires (23) at the entry point of the spring producing work area, where the severance of the wire after the springs are produced is accomplished simultaneously by a common force with mechanical means, being possible for the wires to be cut with hydraulic

cutting mechanisms, where in this case each spring coiler machine has its own incorporated cutting mechanism that is connected to a common hydraulic pressure source, where subsequently the whole produced row of springs through a suitable transport moving belt passes through an enclosed chamber area that is kept at the proper air temperature suitable for the thermal processing of the springs if that is necessary, where subsequently the springs are advanced each one with a separate transport belt, where these belts are being adjusted so as to approach in distance one another so that the springs can acquire the necessary distances amongst them, where with these distances after being compressed (28) concurrently through a lengthwise mechanism they are subsequently advanced and entered within the lengthwise mattress-making material (5), where the mattress-making material being folded along its length with respect to its middle width axis covers them up simultaneously, where subsequently if the employed mattress material is thermally weldable then a lengthwise bar is lowered that bears an equal in number to the springs plus one widthwise thermal welding mechanical systems parallel to one another, having as well lengthwise thermal welding systems to achieve the welding of the two free ends of the folded mattress material, where as a result simultaneous thermal welds (7, 8) are achieved and the formation of all the pockets, being capable for the bar in case the mattress material is not thermally weldable to bear in the respective positions attachment mechanisms that connect the two sides of the mattress material through clips preferably metallic that are activated simultaneously, where each connection clip is leaving these mechanisms with its two ends facing downwards, where while penetrating the mattress material is pushed against a metallic surface suitably formed so that the ends are forced to be bent in a desirable direction, where after getting compressed they become flat creating widthwise and lengthwise attachment connection lines, where subsequently the springs are situated inside the pockets held compressed with their axis oriented at a direction perpendicular (29) to the side surfaces of the pocket, where through a suitable mechanism the springs are forced to rotate by 90^0 so that by expansion their axes coincide with the longitudinal axes (30) of the formed pockets, where the strip created is advanced to come into contact with the previously produced strip (20), onto which and especially at the protruding points where contact takes place hot adhesive quantity (19) is applied so as to consecutively adhere the strips, where the hot adhesive is originating from a lengthwise container (21) that includes a lengthwise mechanism (22) that in a rotational motion applies simultaneously in all the positions or the encapsulated springs of the strip the necessitated quantity of adhesive material producing thus with repetition of the above described sequences the complete mattress product.